

## New data on the fossorial wolf spiders of the genus *Karakumosa* Logunov et Ponomarev, 2020 (Aranei: Lycosidae) from south-western Tajikistan

## Новые сведения о роющих пауках-волках рода *Karakumosa* Logunov et Ponomarev, 2020 (Aranei: Lycosidae) из юго-западного Таджикистана

Alexander A. Fomichev

А.А. Фомичев

Altai State University, Lenina Pr., 61, Barnaul 656049 Russia.

Samarkand State University, 140104, University blv. 15, Samarkand, Uzbekistan.

Алтайский государственный университет, пр. Ленина 61, Барнаул 656049 Россия.

Alexander Fomichev: a.fomichev@mail.ru <https://orcid.org/0000-0001-9268-622X>

**KEY WORDS:** Araneae, biodiversity, Middle Asia, deserts, new species, photos of live specimens, unknown male, *Zyuzicosa*.

**КЛЮЧЕВЫЕ СЛОВА:** Araneae, *Zyuzicosa*, неизвестный самец, новый вид, пустыни, фотографии живых экземпляров, Средняя Азия.

**ABSTRACT.** A new species of the burrowing wolf spiders — *Karakumosa muratovi* sp.n. (♂♀), the smallest representative of the genus — is diagnosed, illustrated and described from south-western Tajikistan. The male of *K. reshetnikovi* Logunov et Fomichev, 2021 is described for the first time; the diagnosis for its female is clarified. Photographs of the habitats and live specimens taken in the wild for both species are provided. The altitudinal limits of *Karakumosa* and *Zyuzicosa* species in Middle Asia, as well as the old dubious records of *K. alticeps* (Kroneberg, 1875) from Tajikistan and the variation of diagnostic characters in the *Karakumosa* male palp, are briefly discussed. The importance of photographing live specimens of burrowing wolf spiders is emphasized.

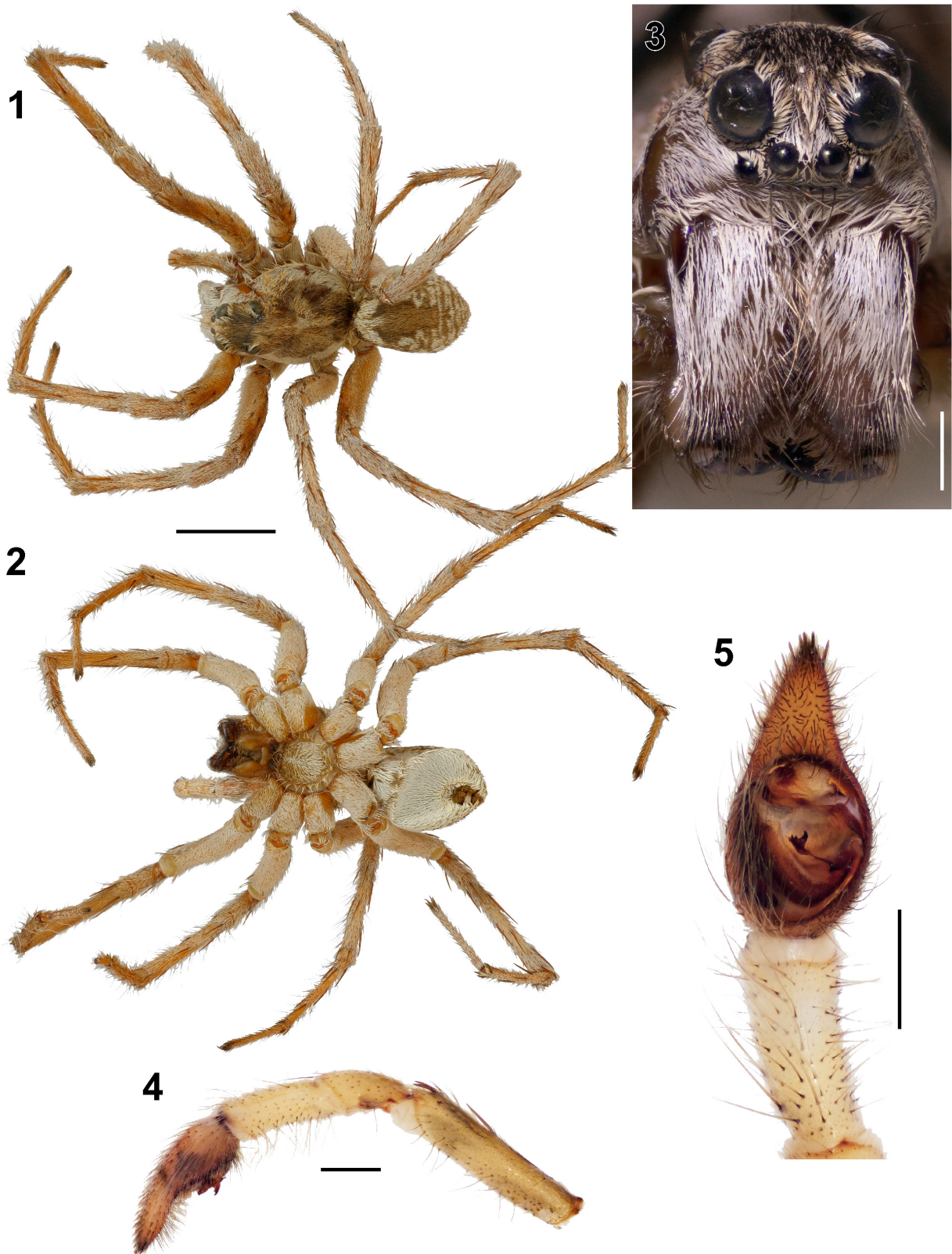
How to cite this paper: Fomichev A.A. 2025. New data on the fossorial wolf spiders of the genus *Karakumosa* Logunov et Ponomarev, 2020 (Aranei: Lycosidae) from south-western Tajikistan // Arthropoda Selecta. Vol.34. No.3. P.396–407. doi: 10.15298/arthscl.34.3.11

**РЕЗЮМЕ.** Из юго-западного Таджикистана описан, диагностирован и иллюстрирован новый вид роющего паука-волка, *Karakumosa muratovi* sp.n. (♂♀), самый мелкий представитель рода. Впервые описан самец *K. reshetnikovi* Logunov et Fomichev, 2021; уточнён диагноз самки этого вида. Приведены фотографии живых экземпляров в природе и фотографии биотопов обоих видов. Кратко обсуждаются вертикальные границы распространения видов родов *Karakumosa* и *Zyuzicosa* в Средней Азии, а также старые сомнительные находки *K. alticeps* (Kroneberg, 1875) в Таджикистане и изменчивость диагностических признаков в педипальпе самцов *Karakumosa*. Обоснована необходимость фотографирования живых особей роющих пауков-волков.

## Introduction

*Karakumosa* Logunov et Ponomarev, 2020 is a relatively small genus of large fossorial wolf spiders, containing 17 species [World Spider Catalog, 2025]. The genus is confined to the (semi)desert zone of Central Palaearctic, ranging from the Caspian Depression in Russia, across Middle Asia, to Ili River valley in China [Logunov, Ponomarev, 2020; Wang *et al.*, 2023]. Most species of *Karakumosa* have a very limited distribution (see Table 1 in Logunov & Ponomarev [2020]). To date, only a few, viz. *K. alticeps* (Kroneberg, 1875), *K. shmatkoi* Logunov et Ponomarev, 2020, *K. sogdiana* Logunov, 2024, *K. turanica* Logunov et Ponomarev, 2020 and *K. zyuzini* Logunov et Ponomarev, 2020, have been known from a number of localities [Logunov, Ponomarev, 2020; Shafaie *et al.*, 2022; Logunov, 2024]; the majority of *Karakumosa* species remain known from the corresponding type localities only. This can be explained by both the current poor state of knowledge of spiders in Middle Asian and the truly restricted ranges of many *Karakumosa* species. Yet, about a third of the *Karakumosa* species remain known only from one sex [World Spider Catalog, 2025].

Although Tajikistan lies at the centre of the known range of the genus, only two species have been reliably recorded from there: *K. reshetnikovi* Logunov et Fomichev, 2021 and *K. severtsovi* Logunov, 2023. Both species were described from single females found in the south-western part of Tajikistan (Khatlon Region) [Logunov, Fomichev, 2021; Logunov, 2023]. During the 2024 expedition to Tajikistan, the author collected several specimens of *K. reshetnikovi*, including previously unknown males, and several specimens of a yet unknown *Karakumosa* species. The aim of the present paper is to diagnose and describe the new species and the previously unknown male of *K. reshetnikovi*.



Figs 1–5. Habitus (1–2), cephalic part (3), whole palp (4) and terminal part of palp (5) of male of *Karakumosa muratovi* sp.n. 1 — dorsal; 2, 5 — ventral; 3 — anterior; 4 — retrolateral. Scale bars: 5 mm (1–2), 1 mm (3–5).

Рис. 1–5. Внешний вид (1–2), головная часть (3), целая пальпа (4) и конечная часть пальпы (5) самца *Karakumosa muratovi* sp.n. 1 — дорсально; 2, 5 — вентрально; 3 — спереди; 4 — ретролатерально. Масштаб: 5 мм (1–2), 1 мм (3–5).

## Material and methods

Spiders were hand-collected at night using a head torch. Preserved specimens were photographed using an Olympus DP74 camera attached to an Olympus SZX16 stereomicroscope at the Altai State University (Barnaul, Russia), and a Fujifilm X-T10 camera with Zeiss Touit 50 mm f/2.8 macro lens. Photographs of male palps and epigynes were taken in an alcohol-filled dish lined with white cotton at the bottom. Photographs of general appearance and cephalic parts were taken after the specimens were slightly dried. Epigynes had been cleared in a 10% KOH-water solution until the soft tissues were dissolved. Digital images were combined using Zerene Stacker and Helicon Focus software packages. Live specimens were photographed by Canon PowerShot SX 620 HS camera. The distribution map was created using the Blue Green Atlas (<https://www.bluegreenatlas.com/index.html>). All measurements are in millimeters. Length of leg segments was measured on their prolateral side. Leg measurements are presented as follows: femur, patella, tibia, metatarsus, tarsus (total length). Spination is based on the examination of one side of the body from a single specimen. Apical spines on the metatarsi were not counted. The terminology and format of the description follow Logunov & Ponomarev [2020] and Fomichev [2023], with changes. The types of the new species have been shared between the Institute of Systematics and Ecology of Animals of Siberian Branch of Russian Academy of Science, Novosibirsk, Russia (ISEA; curator: G.N. Azarkina) and the Zoological Institute of the Russian Academy of Sciences, Saint-Petersburg, Russia (ZISP; curator: D.V. Logunov).

Abbreviations: ALE — anterior lateral eye, AME — anterior median eye, C — conductor, d — dorsal, EA — epigynal atrium, Fe — femur, IP — inner plate of median apophysis, LE — lateral edge, MC — main claw of median tooth, Mr — metatarsus, MT — median tooth of median apophysis, OP — outer plate of median apophysis, p — prolateral, Pa — patella, PE — proximal extension of median apophysis, Pl — palea, PLE — posterior lateral eye, PME — posterior median eye, PP — posterior transverse plate, r — retrolateral, RD — duct of secondary receptacle, RE — retrolateral extension of median apophysis, RH — head of secondary receptacle, SC — secondary claws of median tooth, SD — dorsal synembolic lamella, SV — ventral synembolic lamella, T — tegulum, Ti — tibia, v — ventral.

## Taxonomy

Family Lycosidae Sundevall, 1833

Genus *Karakumosa* Logunov et Ponomarev, 2020

### *Karakumosa muratovi* sp.n.

Figs 1–23, 47–48, 51, 53–54.

TYPES. HOLOTYPE ♂ (ISEA, 001.9560), Tajikistan, Khatlon Region, Vakhsh River valley, Tigrovaya Balka Nature Reserve (=Beshai Palangon) (37°14' N 68°25' E), clayey desert, 300 m a.s.l., 25–26.04.2024, A.A. Fomichev. — PARATYPES: 2♂♂ 2♀♀ (ISEA, 001.9561), 1♀ (ISEA, 001.9562), 1♂ 1♀ (ZISP, ARA\_ARA\_0001539), together with the holotype.

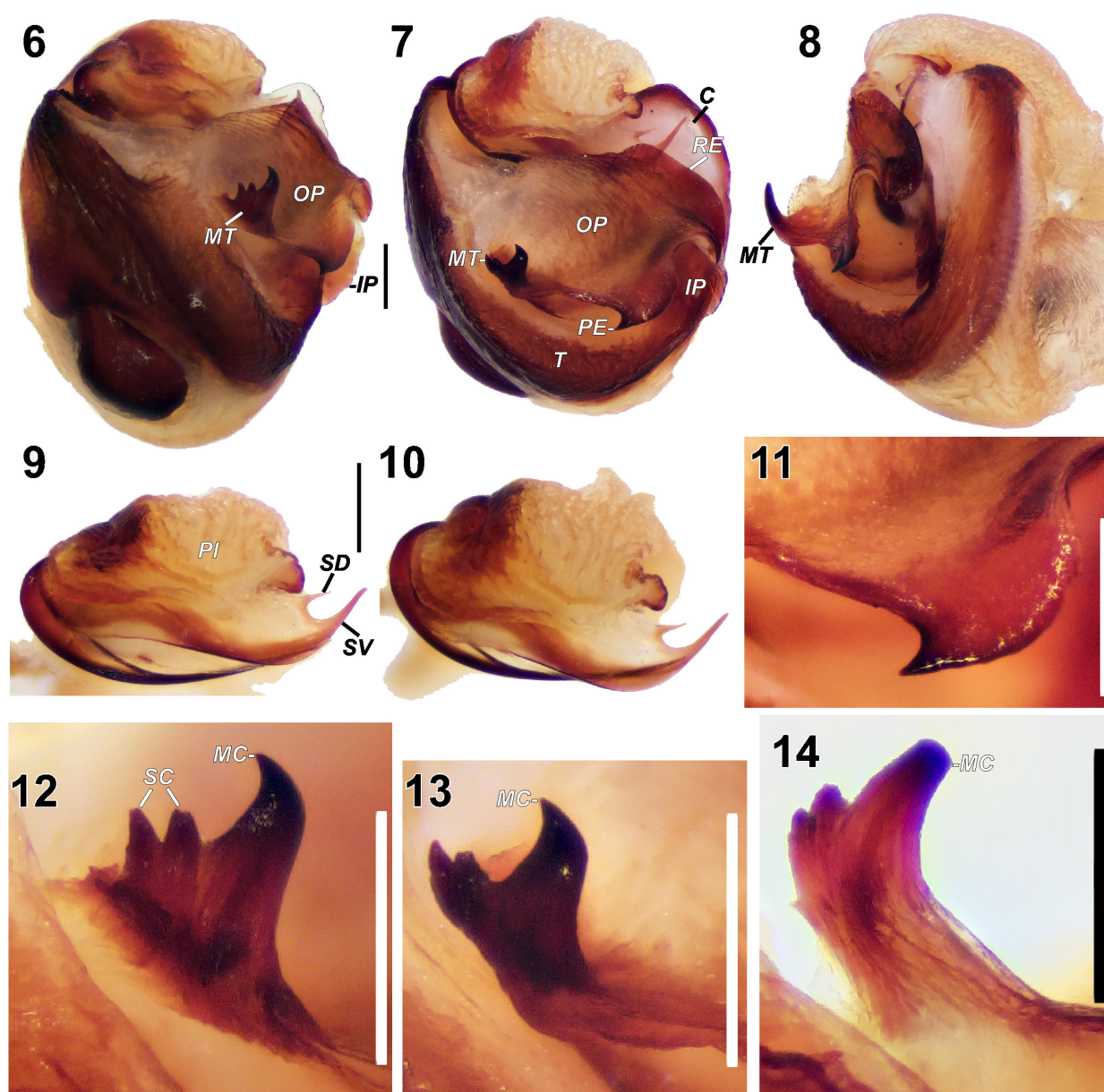
ETYMOLOGY. The new species is named in honour of the Tajik zoologist, Dr Rustam Muratov (Dushanbe, Tajikistan), who helped to organise the 2024 expedition to Tajikistan during which the material studied was collected.

DIAGNOSIS. The male of *K. muratovi* sp.n. is most similar to those of *K. reshetnikovi* (Tajikistan), *K. sogdiana* (Turkmenistan and Uzbekistan), *K. turanica* (Iran and Turkmenistan) and

*K. yahaghii* Shafaie, Nadolny et Mirshamsi, 2022 (Iran). All the five species possess the approximately rectangular outer plate (OP), the main claw (MC) of the median tooth (MT) directed prolaterad, and the proximal extension (PE) with a pointed tip. The male of the new species can be distinguished from those of *K. sogdiana*, *K. turanica* and *K. yahaghii* by MT situated almost at the same level as the PE base (vs. MT sitting distinctly to the front of the PE base; as seen in ventral view, cf. Figs 5, 7 and figs 15, 19 in Logunov [2024], and figs 38–39 in Shafaie *et al.* [2022]). The male of *K. muratovi* sp.n. differs from that of *K. sogdiana* in PE having no basal constriction (cf. Fig. 11 and figs 12–13 in Logunov [2024]). Yet, the male of the new species can be separated: (1) from those of *K. turanica* and *K. yahaghii* by the wider retrolateral extension (RE) (cf. Fig. 7 and figs 19, 21, 23, 25 in Logunov [2024]); (2) from that of *K. reshetnikovi* by strongly curved MC and wider PE (vs. almost straight MC and sharply narrowed PE; cf. Figs 11–14 and Figs 34–37); and (3) from that of *K. yahaghii* by comparatively smaller MC, wider PE (cf. Fig. 7 and figs 38–39 in Shafaie *et al.* [2022]) and by the dark cardiac mark combined with a herringbone pattern (vs. the light cardiac mark and no herringbone pattern; cf. Figs 1, 47 and fig. 33 in Shafaie *et al.* [2022]).

The female of *K. muratovi* sp.n. is most similar to those of *K. reshetnikovi*, *K. sogdiana*, *K. turanica* and *K. zyzuni* from Iran and Uzbekistan. All these species have the epigynal atrium (EA) approximately 1.5–2 times longer than wide, with subparallel lateral edges (LE) and narrow, anchor-shaped transverse posterior plate (PP). The female of new species can be distinguished from those of all similar species by EA strongly widened anteriorly (cf. Figs 18–21 and Figs 41–44 with figs 5, 9, 11 in Logunov & Fomichev [2021] and figs 30–32 in Logunov [2024]), acutely expanded and irregularly-shaped heads of secondary receptacles (RH), and the sharply curved ducts of secondary receptacles (RD) (vs. elongated, tube-shaped RH in *K. sogdiana*, *K. turanica* and *K. zyzuni*, or ball-shaped in *K. reshetnikovi* with smoothly curved RD; cf. Figs 22–23 and Figs 45–46 and figs 7, 10, 12 in Logunov & Fomichev [2021] and figs 36–38 in Logunov [2024]).

DESCRIPTION. Male (holotype). General appearance as in Figs 1–3, 47. Total length 13.1. Carapace: 7.0 long, 5.3 wide. Abdomen: 6.2 long, 4.5 wide. Eye sizes and interdistances: AME 0.43, ALE 0.39, PME 0.97, PLE 0.86, AME–AME 0.29, AME–ALE 0.16, PME–PME 0.89, PME–PLE 0.79. Width of anterior eye row 1.79, second row 2.50, third row 2.85. Clypeus height at AME 0.40. Chelicera length 3.28. Length of leg segments: I: 7.0, 2.6, 6.1, 6.2, 3.5 (25.4); II: 6.9, 2.6, 5.6, 6.5, 3.2 (24.8); III: 6.3, 2.5, 4.9, 6.7, 3.3 (23.7); IV: 7.8, 2.8, 6.4, 8.9, 3.9 (29.8). Leg formula: IV, I, II, III. Spination of legs: I: Fe d1-1-1 p0-0-2 r1-2-1; Pa p1 r1; Ti d1-1-0 p1-0-1 r1-0-1 v2-2-2; Mr p1-1-0 r1-1-0 v2-2-0. II: Fe d1-1-1 p1-1-1 r1-1-1; Pa p1 r1; Ti d1-0-1 p1-0-1 r1-0-1 v2-2-2; Mr p1-1-0 r1-1-0 v2-2-0. III: Fe d1-1-1 p2-1-1 r0-2-1; Pa p1 r1; Ti d1-0-1 p1-0-1 r1-0-1 v2-2-2; Mr p1-1-0 r1-1-0 v2-2-0. IV: Fe d1-1-1 p1-1-1 r0-0-1; Pa p1 r1; Ti d1-0-1 p1-0-1 r1-0-1 v2-2-2; Mr p1-1-0 r1-1-0 v3-0-2. Colouration (based on a slightly dried specimen extracted from alcohol): body, except for labium and endites, covered with beige setae. Carapace brown, with a thin light median stripe from eye field to posterior margin and wide light lateral stripes. Eye field almost black. Clypeus grey. PMEs surrounded by yellow-grey setae. Chelicerae grey. Sternum, labium, endites and coxae yellow-brown. Palps yellow-brown, cymbium brown. Legs yellow-brown, without annulations. Abdomen beige: dorsum with grey cardiac mark and a herringbone pattern, venter beige. Spinnerets brown-grey. Male palp as in Figs 4–14. Femur twice as long as tibia. Patella slightly shorter than tibia. Tibia 1.5 times shorter than cymbium. Cymbium 2.1 times and bulb



Figs 6–14. Bulb (6–8), embolic division (9–10), proximal extension (11) and median tooth (12–14) of male of *Karakumosa muratovi* sp.n. 6, 12 — prolateral; 7, 9, 11, 13 — ventral; 8 — retrolateral; 10 — anterior; 14 — posterior. Scale bars: 0.2 mm. Abbreviations: C — conductor, IP — inner plate of median apophysis, MC — main claw of median tooth, MT — median tooth of median apophysis, OP — outer plate of median apophysis, PE — proximal extension of median apophysis, PI — palea, RE — retrolateral extension of median apophysis, SC — secondary claws of median tooth, SD — dorsal synembolic lamella, SV — ventral synembolic lamella, T — tegulum.

Рис. 6–14. Бульбус (6–8), эмболюсный отдел (9–10), проксимальный отросток (11) и медиальный зубец (12–14) самца *Karakumosa muratovi* sp.n. 6, 12 — пролатерально; 7, 9, 11, 13 — вентрально; 8 — ретролатерально; 10 — спереди; 14 — сзади. Масштаб: 0,2 мм. Сокращения: C — кондуктор, IP — внутренняя пластинка медиального отростка, MC — главный коготь медиального зубца, MT — медиальный зубец медиального отростка, OP — внешняя пластинка медиального отростка, PE — проксимальный отросток медиального отростка, PI — паля, RE — ретролатеральный отросток медиального отростка, SC — побочные когти медиального зубца, SD — дорсальная пластинка синэмболюса, SV — вентральная пластинка синэмболюса, T — тегулюм.

1.2 times as long as wide. Outer plate of median apophysis (OP) almost rectangular. Median tooth of median apophysis (MT) three-clawed. Main claw (MC) of MT sharply curved, 3 times longer than secondary claws (SC). Proximal extension of median apophysis (PE) sharply pointed, as long as MC in ventral view. Retrolateral extension of median apophysis (RE) with straight anterior margin. Inner plate of median apophysis (IP) narrowed, extending beyond tegulum (T) in ventral view. Conductor (C) low, poorly visible in ventral view. Palea (PI) 2 times as wide as

long. Acutely pointed synembolic lamellae converging, ventral one (SV) twice as long as dorsal one (SD). Embolus (E) smoothly curved, smoothly tapering from basal part.

Female (paratype). General appearance as in Figs 15–17, 48. Total length 17.0. Carapace: 8.5 long, 6.7 wide. Abdomen: 10.0 long, 7.0 wide. Eye sizes and interdistances: AME 0.51, ALE 0.44, PME 1.17, PLE 1.09, AME–AME 0.29, AME–ALE 0.20, PME–PME 0.96, PME–PLE 1.00. Width of anterior eye row 2.33, second row 3.03, third row 3.58. Clypeus height at



Figs 15–17. Habitus (15–16) and cephalic part (17) of female of *Karakumosa muratovi* sp.n. 15 — dorsal; 16 — ventral; 17 — anterior. Scale bars: 5 mm (15–16), 1 mm (17).

Рис. 15–17. Внешний вид (15–16) и головная часть (17) самки *Karakumosa muratovi* sp.n. 15 — дорсально; 16 — вентрально; 17 — спереди. Масштаб: 5 мм (15–16), 1 мм (17).

AME 0.45. Chelicera length 4.75. Length of leg segments: I: 7.2, 3.2, 5.8, 5.0, 3.0 (24.2); II: 6.6, 3.3, 5.0, 4.9, 3.0 (22.8); III: 6.2, 3.0, 4.2, 5.3, 3.1 (21.8); IV: 8.0, 3.1, 5.9, 7.3, 3.7 (28.0). Leg formula: IV, I, II, III. Spination of legs: I: Fe d1-1-1 p0-0-2 r1-1-1; Pa p1; Ti p1-0-1 v2-2-2; Mr v2-2-0. II: Fe d1-1-1 p0-1-1 r1-1-1; Pa p1; Ti p1-0-1 v2-2-2; Mr p1-0-0 v2-2-0. III: Fe d1-1-1 p1-1-1 r0-2-1; Pa p1 r1; Ti d1-0-1 p1-0-0 r1-0-2 v2-2-2; Mr p1-1-0 r1-1-0 v2-2-0. IV: Fe d1-1-1 p0-1-1 r0-0-1; Pa p1 r1; Ti d1-0-1 p1-0-1 r1-0-1 v2-2-2; Mr p1-1-0 r1-1-0 v3-0-2. Colouration as in the male, but abdomen more greyish. Epigyne as in Figs 18–23. Epigynal atrium (EA) 1.5 times as long as wide, strongly widened anteriorly. Lateral edges (LE) subparallel. Posterior transverse plate (PP) anchor-shaped, 3.5 times as wide as long. Heads of secondary receptacles (RH) acutely expanded, irregularly-shaped, parallel to each other. Ducts of secondary receptacles (RD) strongly curved.

VARIATION. A number of the secondary claws of median tooth varies from 0 to 4.

DISTRIBUTION. Only the type locality (Figs 51, 53–54).

COMMENTS. *Karakumosa muratovi* sp.n., with the carapace length of 7.0 in the male and 8.5 in the female, is the smallest representative of the genus. The carapace length in

males/females of the other *Karakumosa* species varies from 7.65/8.70 in *K. badkhyzica* Logunov et Ponomarev, 2020 from Turkmenistan to 14.4/? in the Iranian *K. sarvari* Shafaie, Nadolny et Mirshamsi, 2022 [Logunov, Ponomarev, 2020; Shafaie et al., 2022]. The female of *K. sarvari* is yet unknown.

***Karakumosa reshetnikovi*  
Logunov et Fomichev, 2021**

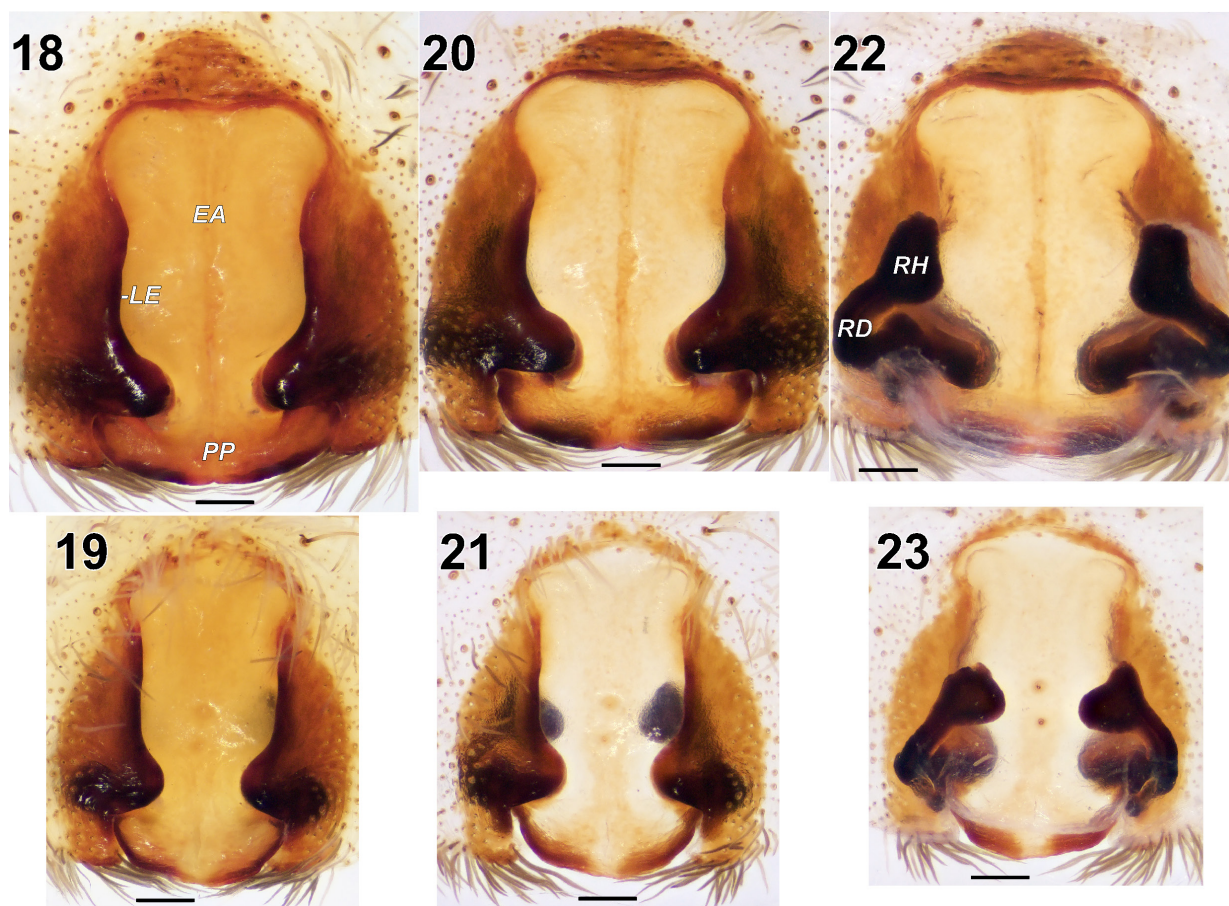
Figs 24–46, 49–50, 52–54.

*K. reshetnikovi* Logunov et Fomichev 2021: 678, figs 1–8 (♀); holotype ♀ in MMUE, examined.

TYPE MATERIAL. HOLOTYPE ♀ (MMUE, G7649.1), Tajikistan Khatlon Region, Ichkoran Mt. Range, Teshiktosh Village (37°08.612'N, 68°14.404'E), stony desert with rocks, 450–550 m a.s.l., 5–6.04.2019, A.A. Fomichev.

OTHER MATERIAL. TAJIKISTAN: 1♂ (ISEA, 001.9563), 2♂♂ (ISEA, 001.9564), 1♀ (ISEA, 001.9565), 2♂♂ 1♀ (ZISP, ARA\_ARA\_00015340), Khatlon Region, Aruktau Mt. Range, 4 km ENE from Garavuti Village (37°35.212'N, 68°31.547'E), stony desert with rocks, 400 m a.s.l., 24–25.04.2024, A.A. Fomichev.

DIAGNOSIS. The male of *K. reshetnikovi* is most similar to those of *K. muratovi* sp.n., *K. sogdiana*, *K. turanica* and *K.*



Figs 18–23. Epigyne of *Karakumosa muratovi* sp.n. 18–19 — intact, ventral; 20–21 — macerated, ventral; 22–23 — macerated, dorsal. Scale bars: 0.2 mm. Abbreviations: *EA* — epigynal atrium, *LE* — lateral edge, *PP* — posterior transverse plate, *RD* — duct of secondary receptacle, *RH* — head of secondary receptacle.

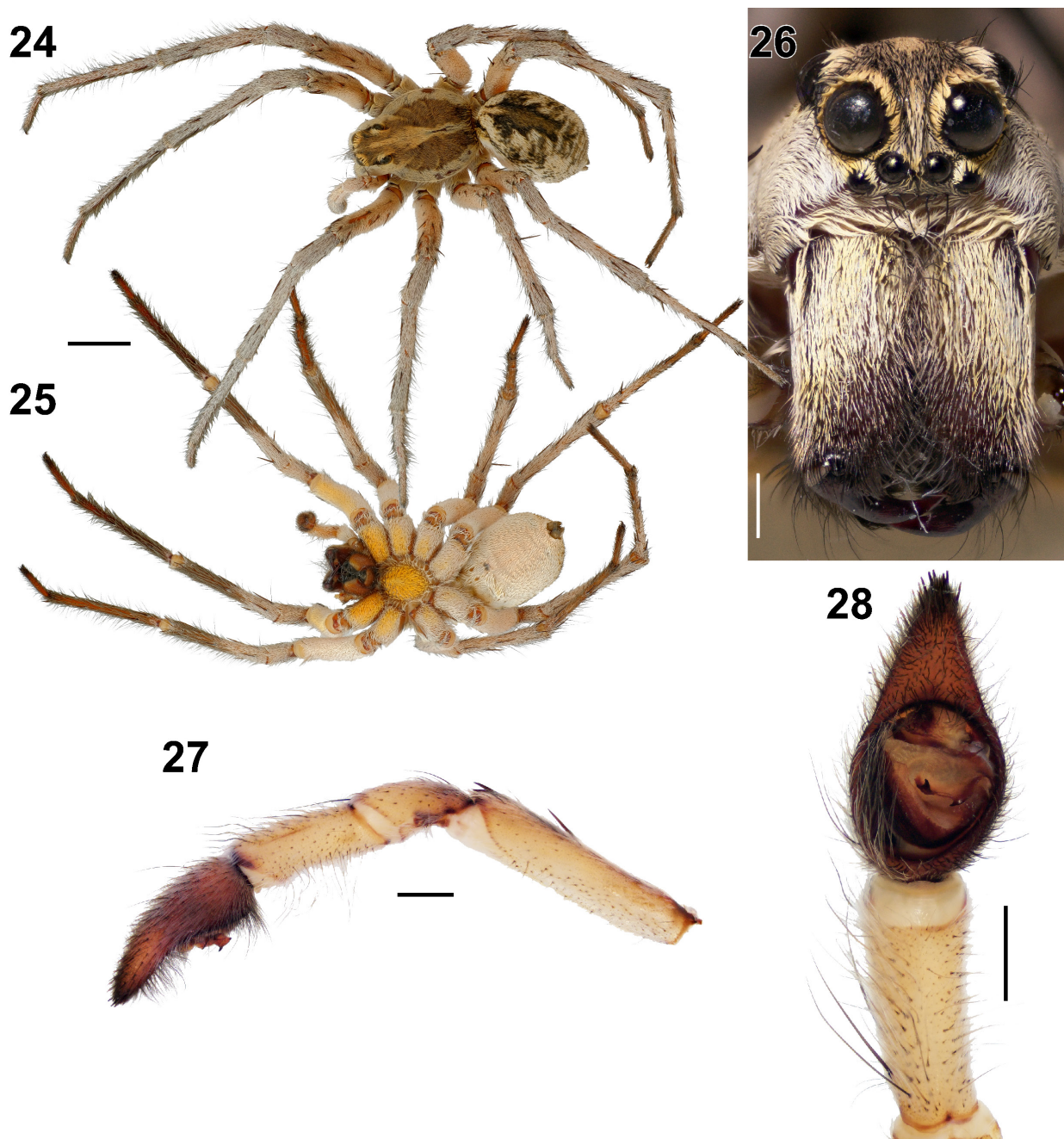
Рис. 18–23. Эпигина *Karakumosa muratovi* sp.n. 18–19 — интактная, вентрально; 20–21 — мацерированная, вентрально; 22–23 — мацерированная, дорсально. Масштаб: 0,2 мм. Сокращения: *EA* — атриум эпигины, *LE* — боковой край, *PP* — задняя поперечная пластинка, *RD* — проток вторичной рецептакулы, *RH* — головка вторичной рецептакулы.

*yahaghii*. All the five species possess the nearly rectangular outer plate (*OP*), the main claw (*MC*) of the median tooth (*MT*) directed prolaterad, and the pointed tip of the proximal extension (*PE*). The male of *K. reshetnikovi* can be distinguished from those of *K. sogdiana*, *K. turanica* and *K. yahaghii* by *MT* situated almost at the same level as the *PE* base (vs. *MT* sitting distinctly to the front of the *PE* base; as seen in ventral view, cf. Figs 28, 30 and figs 15, 19 in Logunov [2024] and 38–39 in Shafaie *et al.* [2022]). Yet, the male of *K. reshetnikovi* differs from those of *K. muratovi* sp.n., *K. sogdiana* and *K. turanica* by the sharply narrowed *PE* (vs. wide; cf. Figs 11, 34 and figs 12–14 in Logunov [2024]). Finally, the male of *K. reshetnikovi* can be separated from those of *K. muratovi* sp.n. and *K. yahaghii* by the almost straight *MC* (vs. the strongly curved *MC*; cf. Figs 12–14, 35–37 and figs 38–39 in Shafaie *et al.* [2022]).

The female of *K. reshetnikovi* is most similar to those of *K. muratovi* sp.n., *K. sogdiana*, *K. turanica* and *K. zyzini*. All these species have the epigynal atrium (*EA*) approximately 1.5–2 times as long as wide, with subparallel lateral edges (*LE*) and the narrow, anchor-shaped transverse posterior plate (*PP*). The female of *K. reshetnikovi* can be distinguished from those of *K. sogdiana*, *K. turanica* and *K. zyzini* by the relatively lower and wider *PP*: width/length ratio *c.* 3.3 (compared to 2.2–3.1 in the related species; cf. Figs 41–44 and figs 30–32 in Logunov [2024], figs 9, 11 in Logunov & Fomichev [2021])

and the round, ball-shaped heads of secondary receptacles (*RH*) (vs. elongated tube-shaped; cf. Figs 45–46 and figs 36–38 in Logunov [2024], figs 10, 12 in Logunov & Fomichev [2021]). From *K. muratovi* sp.n., it differs in the anterior part of *EA* being narrower or as wide as the median part and the ball-shaped *RH* (vs. the anterior part of *EA* wider than the median part and the irregularly-shaped *RH*; cf. Figs 41–46 and 18–23).

**DESCRIPTION.** Male. General appearance as in Figs 24–26, 49. Total length 17.5. Carapace: 10.0 long, 7.5 wide. Abdomen: 9.8 long, 4.5 wide. Eye sizes and interdistances: AME 0.43, ALE 0.43, PME 1.21, PLE 0.93, AME–AME 0.23, AME–ALE 0.19, PME–PME 0.79, PME–PLE 1.00. Width of anterior eye row 2.07, second row 2.80, third row 3.40. Clypeus height at AME 0.75. Chelicera length 4.00. Length of leg segments: I: 10.5, 3.7, 8.6, 9.5, 4.3 (36.6); II: 10.0, 3.2, 8.3, 9.6, 4.2 (35.3); III: 9.0, 3.6, 7.0, 9.7, 3.9 (33.2); IV: 10.9, 3.9, 9.0, 12.5, 4.6 (40.9). Leg formula: IV, I, II, III. Spination of legs: I: Fe d1-1-1 p0-0-2 r1-1-1; Pa p1 r1; Ti d0-1-0 p1-0-1 r1-0-1 v2-2-2; Mr p1-1-0 r1-1-0 v2-2-2. II: Fe d1-1-1 p0-1-1 r1-1-1; Pa p1 r1; Ti d0-0-1 p1-0-1 r1-0-1 v2-2-2; Mr p1-1-0 r1-1-0 v2-2-0. III: Fe d1-1-1 p1-1-1 r1-1-1; Pa p1 r1; Ti d1-0-1 p1-0-0 r1-0-1 v2-2-2; Mr p1-1-0 r1-1-0 v2-2-0. IV: Fe d1-1-1 p1-1-1 r0-0-1; Pa p1 r1; Ti d1-0-1 p1-0-1 r1-0-1 v2-2-2; Mr p1-1-0 r1-1-0 v2-1-2. Colouration (based on a slightly dried specimen extracted from alcohol): body, except for labium

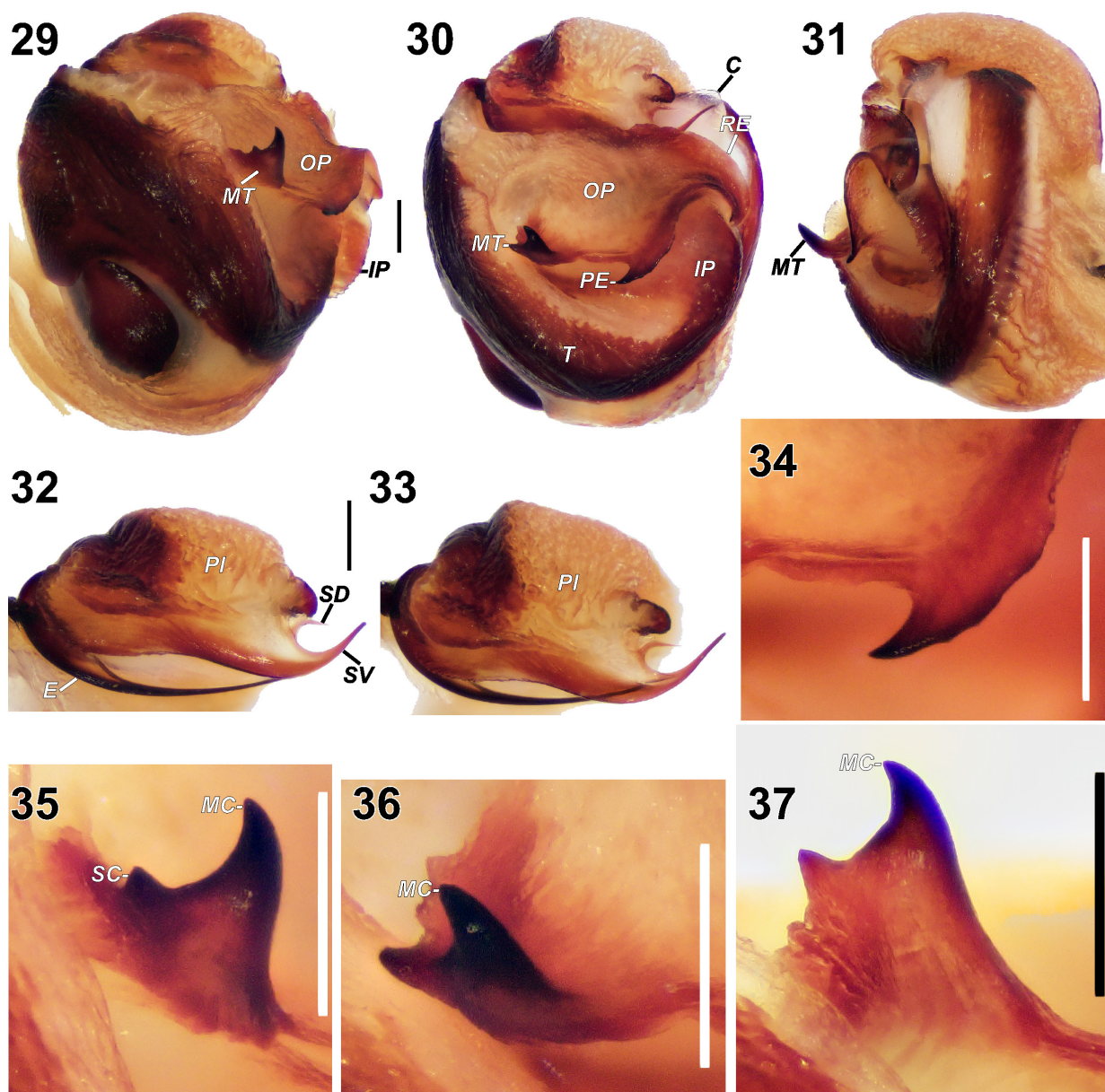


Figs 24–28. Habitus (24–25), cephalic part (26), whole palp (27) and terminal part of palp (28) of male of *Karakumosa reshetnikovi*. 24 — dorsal; 25, 28 — ventral; 26 — anterior; 27 — retrolateral. Scale bars: 5 mm (24–25), 1 mm (26–28).

Рис. 24–28. Внешний вид (24–25), головная часть (26), целая пальпа (27) и конечная часть пальпы (28) самца *Karakumosa reshetnikovi*. 24 — дорсально; 25, 28 — вентрально; 26 — спереди; 27 — ретролатерально. Масштаб: 5 мм (24–25), 1 мм (26–28).

and endites, covered with beige setae. Carapace brown, with a wide light median stripe from eye field to posterior margin and wide light lateral stripes. Eye field dark brown. Clypeus grey. PME surrounded by yellow setae. Chelicerae grey, with sparse yellow setae. Labium and endites dark brown. Sternum and coxae I–II covered with golden setae. Coxae III–IV beige. Palps yellow-brown, cymbium dark brown. Legs brown-grey, without annulations. Abdomen beige: dorsum with grey cardiac mark and a herringbone pattern; venter beige. Spinnerets brown-grey. Male palp as shown in Figs 27–37. Femur twice as long as tibia. Patella slightly shorter than tibia. Tibia 1.4 times

as short as cymbium. Cymbium 2 times and bulb 1.2 times as long as wide. Outer plate of median apophysis (OP) almost rectangular. Median tooth of median apophysis (MT) two-clawed: main claw (MC) smoothly curved, 3 times as long as secondary claw (SC). Proximal extension of median apophysis (PE) sharply pointed, as long as MC in ventral view. Retrolateral extension of median apophysis (RE) with slightly rounded anterior margin. Inner plate of median apophysis (IP) ovoid, not extending beyond tegulum (T) in ventral view. Conductor (C) in the shape of right angle. Palea (Pl) 2 times as wide as long. Acutely pointed synembolic lamellae converging, ventral one



Figs 29–37. Bulb (29–31), embolic division (32–33), proximal extension (34) and median tooth (35–37) of male of *Karakumosa reshethnikovi*. 29, 35 — prolateral; 30, 32, 34, 36 — ventral; 31 — retrolateral; 33 — anterior; 37 — posterior. Scale bars: 0.2 mm. Abbreviations: *C* — conductor, *IP* — inner plate of median apophysis, *MC* — main claw of median tooth, *MT* — median tooth of median apophysis, *OP* — outer plate of median apophysis, *PE* — proximal extension of median apophysis, *PI* — palea, *RE* — retrolateral extension of median apophysis, *SC* — secondary claw of median tooth, *SD* — dorsal synembolic lamella, *SV* — ventral synembolic lamella, *T* — tegulum.

Рис. 29–37. Бульбус (29–31), эмболюсный отдел (32–33), проксимальный отросток (34) и медиальный зубец (35–37) самца *Karakumosa reshethnikovi*. 29, 35 — пролатерально; 30, 32, 34, 36 — вентрально; 31 — ретролатерально; 33 — спереди; 37 — сзади. Масштаб: 0,2 мм. Сокращения: *C* — кондуктор, *IP* — внутренняя пластинка медиального отростка, *MC* — главный коготь медиального зубца, *MT* — медиальный зубец медиального отростка, *OP* — внешняя пластинка медиального отростка, *PE* — проксимальный отросток медиального отростка, *PI* — палея, *RE* — ретролатеральный отросток медиального отростка, *SC* — побочные когти медиального зубца, *SD* — дорсальная пластинка синэмболюса, *SV* — вентральная пластинка синэмболюса, *T* — тегулюм.

(*SV*) twice as long as dorsal one (*SD*). Embolus (*E*) smoothly curved, sharply tapering from basal part.

Female. See Logunov & Fomichev [2021] for detailed description. General appearance as in Figs 38–40, 50. Epigyne as shown in Figs 41–46. Epigynal atrium (*EA*) 2.1 times longer than wide, widened medially. Lateral edges (*LE*) subparallel. Posterior transverse plate (*PP*) anchor-shaped, 3.1 times wider than long. Heads of secondary receptacles (*RH*) ball-shaped,

converging. Ducts of secondary receptacles (*RD*) smoothly curved.

VARIATION. A number of secondary claws of median tooth varies from 0 to 2.

DISTRIBUTION. SW part of Khatlon Region of Tajikistan: Ichkoran and Aruktau Mt. Ranges (Figs 52–54).

COMMENTS. *Karakumosa reshethnikovi* was described from a single female from the Ichkoran Mt. Range [Logunov,

38



39



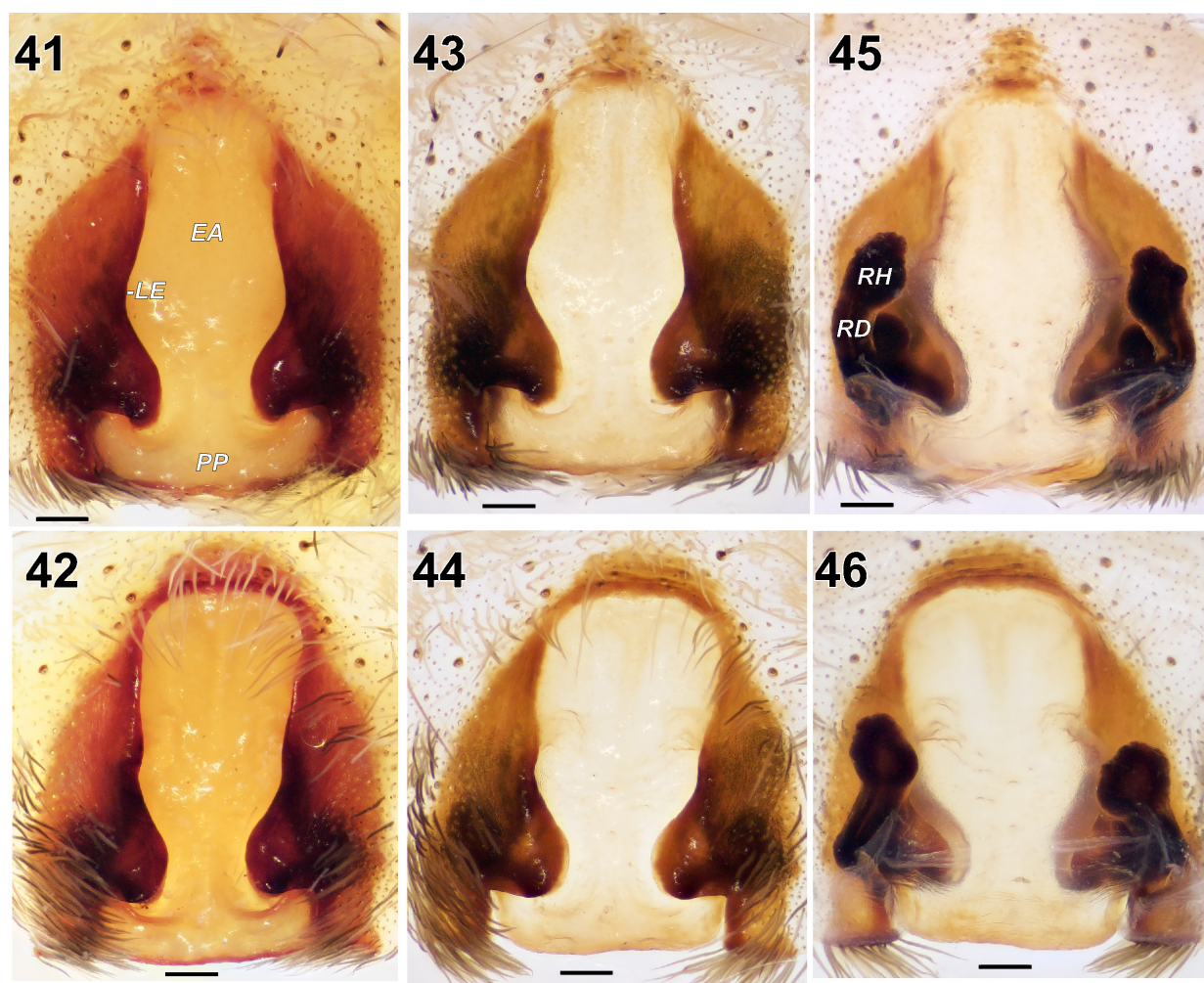
Figs 38–40. Habitus (38–39) and cephalic part (40) of female of *Karakumosa reshetnikovi*. 38 — dorsal; 39 — ventral; 40 — anterior. Scale bars: 5 mm (38–39), 1 mm (40).

Рис. 38–40. Внешний вид (38–39) и головная часть (40) самки *Karakumosa reshetnikovi*. 38 — дорсально; 39 — вентрально; 40 — спереди. Масштаб: 5 мм (38–39); 1 мм (40).

Fomichev, 2021], and has been collected from outside its type locality for the first time. The distance between the Aruktau Mt. Range, where new specimens were collected, and the type locality is about 60 km. No significant barriers to dispersal, such as high mountains or large river valleys, are present, as the entire area consists of low rocky desert. The epigynes of the newly collected females are almost identical to that of the holotype. Both sexes of *K. reshetnikovi* exhibit a conspicuous feature that is unknown in the congeners: sternum and coxae are covered with golden setae (Figs 25, 39). This feature is not visible when examining spiders preserved in ethanol. The Chinese *K. xinjiang* Wang, Yang et Zhang, 2023 is coloured ventrally in a similar way but with orange setae covering the ventral side of femora I, rather than sternum and coxae [Wang *et al.*, 2023].

## Discussion

The genus *Karakumosa* was recently established by Logunov & Ponomarev [2020] to accommodate nine species of fossorial wolf spiders from the Central Palaearctic. The latter authors transferred two species from *Hogna* Simon, 1885 to the newly established genus, and the remaining seven species were described as new. Although this study covered most of Middle Asia, no specimens from Tajikistan were available to the authors. Subsequently a new species, *K. reshetnikovi*, was described from Tajikistan by Logunov & Fomichev [2021]. However, congeners of *Karakumosa* were formally re-



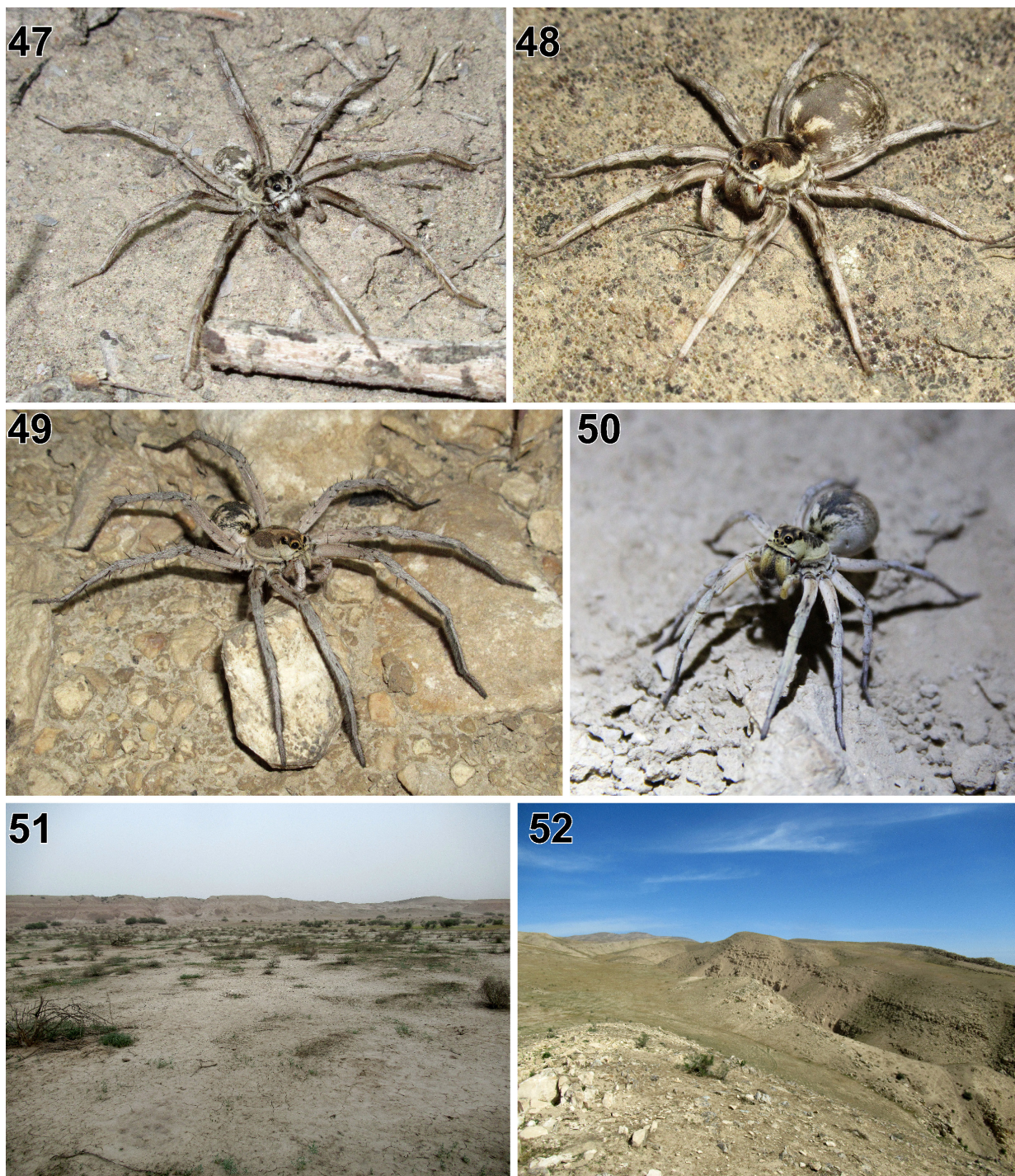
Figs 41–46. Epigyne of *Karakumosa reshethnikovi*. 41–42 — intact, ventral; 43–44 — macerated, ventral; 45–46 — macerated, dorsal. Scale bars: 0.2 mm. Abbreviations: EA — epigynal atrium, LE — lateral edge, PP — posterior transverse plate, RD — duct of secondary receptacle, RH — head of secondary receptacle.

Рис. 41–46. Эпигина *Karakumosa reshethnikovi*. 41–42 — интактная, вентрально; 43–44 — мацерированная, вентрально; 45–46 — мацерированная, дорсально. Масштаб: 0,2 мм. Сокращения: EA — атриум эпигины, LE — боковой край, PP — задняя поперечная пластинка, RD — проток вторичной рецептакулы, RH — головка вторичной рецептакулы.

cordd from Tajikistan much earlier by Andreeva [1975, 1976], who reported on *K. alticeps* (sub *Lycosa alticeps*) from the Hissar Mt. Range and its southern spurs (Varzob Canyon, Ramit and Gandzhino Villages, and Aruktau Mt. Range) (Figs 53–54). Currently, the whereabouts of these specimens remain unknown. They are absent from the collections of both ZISP, and the Museum and Institute of Zoology of the Polish Academy of Sciences (MIIZ, Warsaw, Poland), where the bulk of E.M. Andreeva's spider collections are deposited (D.V. Logunov, pers. comm., 20.02.2025).

The records of *K. alticeps* from Tajikistan were probably based on misidentifications, since this species is known to be restricted to southern Kazakhstan [Logunov, Ponomarev 2020]. In my opinion, the above-mentioned records of *Karakumosa* from Hissar may not even belong to this genus, but rather to *Zyuzicosa* Logunov, 2010. All the Middle Asian species of *Karakumosa* inhabit deserts at the altitudes ranging from 0 to about 700 m a.s.l. [Logu-

nov, Ponomarev, 2020; Logunov, Fomichev, 2021; Wang *et al.*, 2023; Logunov, 2023, 2024] (Figs 51–52). Yet in Iran, these wolf spiders are found at higher altitudes (up to 1,500 m a.s.l.) while remaining confined to deserts [Shafaie *et al.*, 2022]. The elevations at the localities in Hissar from where Andreeva reported on *K. alticeps* (Varzob, Ramit) exceed 1200 m a.s.l. At such elevations, deserts are absent in this region, but much more humid shrublands are present. Species from exclusively Middle Asian genus *Zyuzicosa*, which inhabit the altitudes of 400–2000 m a.s.l., are more likely to occupy such habitats [Logunov, 2012; Fomichev, 2023: fig. 12; Logunov, 2023: figs 182–184]. Indeed, several *Zyuzicosa* species have been described from Hissar, including samples from Andreeva's spider collection [Logunov, 2012, 2023]. However, in the lowlands of south-western Tajikistan, along the border with Afghanistan, unknown *Karakumosa* species may still occur. Hence, further research in this region is much needed.



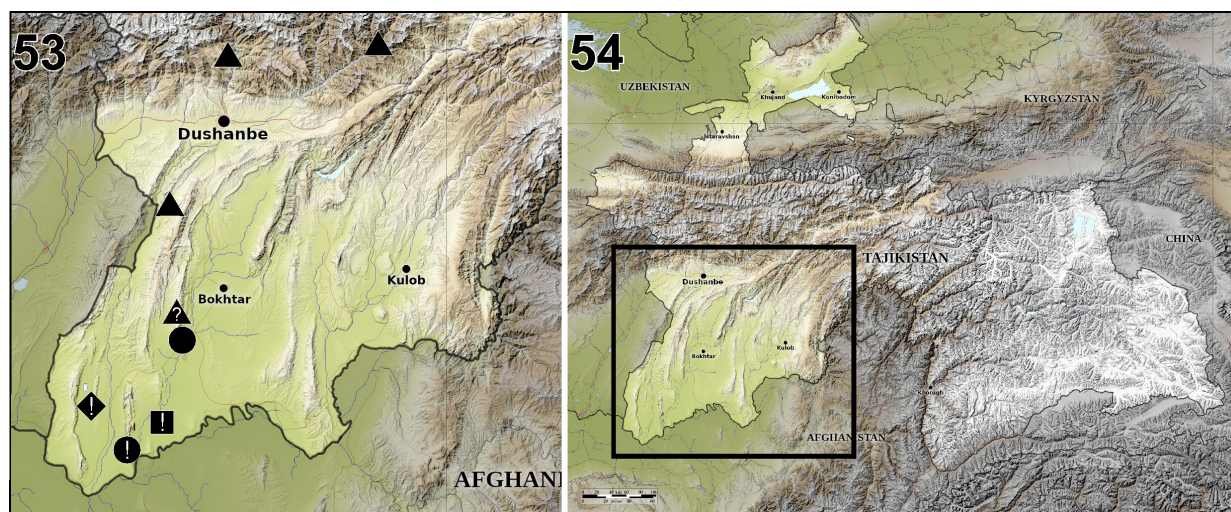
Figs 47–52. Live male (47) and female (48) of *Karakumosa muratovi* sp.n., live male (49) and female (50) of *K. reshetnikovi*, habitat of *K. muratovi* sp.n. in Tigrovaya Balka Nature Reserve (51) and habitat of *K. reshetnikovi* in Aruktau Mt. Range (52). 50 — courtesy by Artem E. Naydenov.

Рис. 47–52. Живой самец (47) и самка (48) *Karakumosa muratovi* sp.n., живой самец (49) и самка (50) *K. reshetnikovi*, биотоп *K. muratovi* sp.n. в заповеднике “Тигровая Балка” (51) и биотоп *K. reshetnikovi* на хребте Аруктау (52). 50 — предоставлено А.Е. Найденовым.

Large fossorial wolf spiders can be distinguished not only by their copulatory organs, but also by their general appearances. Unfortunately, due to their usually large size, fossorial wolf spiders can be seriously damaged after preservation, becoming deformed and/or losing covering setae and colour features. Wang *et al.* [2023] already highlighted differences in the body colouration between live

and preserved specimens of *K. xinjiang*. Therefore, when collecting fossorial wolf spiders, it would be advisable to photograph them live first. By providing photos of live specimens in the present paper, it is my hope to initiate such a tradition for the group under study.

As pointed out by Logunov [2024], one of the main problems in taxonomic studies of Middle Asian fossil



Figs 53–54. Collecting localities of *Karakumosa* in Tajikistan. Square — *K. muratovi* sp.n.; circle — *K. reshetnikovi*; diamond — *K. severtsovi*; triangle — doubtful records of *K. alticeps* by Andreeva [1975; 1976]. ! — type localities; ? — record without precise locality. The frame on Fig. 54 refers to the content of Fig. 53.

Рис. 53–54. Точки сбора видов *Karakumosa* в Таджикистане. Квадрат — *K. muratovi* sp.n.; круг — *K. reshetnikovi*; ромб — *K. severtsovi*; треугольник — сомнительные находки *K. alticeps* [Andreeva, 1975; 1976]. ! — типовая местность; ? — находка без точного местоположения. Рамка на рис. 54 соответствует содержанию рис. 53.

lycosids, including *Karakumosa*, is that most species are known from short series of specimens. This makes it difficult to assess the degree of variation in diagnostic features and may lead to mistakes and unclear diagnoses. The present study of even a small series of males (four in *K. muratovi* sp.n. and five in *K. reshetnikovi*) has demonstrated that such a character as the number of secondary claws of the median tooth is very variable and cannot be reliably used for species identification. This conclusion is in full agreement with Logunov's data [Logunov, 2024: figs 11, 16, 18, 20, 22, 24, 26]. The number of secondary claws may even differ when comparing left and right palps of the same specimen. The study of the existing male series of *K. muratovi* sp.n. and *K. reshetnikovi* has also shown that the shape of the proximal extension of the median apophysis is a more stable diagnostic trait, which also agrees with the conclusions by Logunov [2024: 412]. The position of the median tooth in relation to the base of the proximal extension of the median apophysis (a distance between them) seems to be another reliable diagnostic feature in the genus *Karakumosa*.

**Acknowledgements.** I thank Roman V. Yakovlev, Artem E. Naydenov (both from Barnaul, Russia), Rustam Muratov (Dushanbe, Tajikistan), Uvaido Kudratbekov (Porshinev, Tajikistan), Roman V. Dudko and Sergei V. Reshetnikov (both from ISEA) for the help with organizing and undertaking the 2024 expedition to Tajikistan, in which the material presented in this paper was collected. I also wish to thank Sergei V. Reshetnikov for his help with taking digital photos and Artem E. Naydenov for providing a photo of a live female of *K. reshetnikovi*. I am grateful to Mikhail M. Omelko (Vladivostok, Russia) for commenting on an early draft of the manuscript. I also wish to thank the editor and the reviewers for their critical comments that helped to improve the manuscript.

## References

- Andreeva E.M. 1975. Distribution and ecology of spiders (Aranei) in Tadjikistan // *Fragmenta Faunistica*. Vol.20. P.323–352.
- Andreeva E.M. 1976. Pauki Tajikistana. Dushanbe: Donish. 196 pp. [in Russian]
- Blue Green Atlas. 2025. <https://www.bluegreenatlas.com/index.html>
- Fomichev A.A. 2023. A new species of *Zyuzicosa* Logunov, 2010 (Araneae: Lycosidae) from Uzbekistan // *Arachnology*. Vol.19. Pt.6. P.952–954. <https://doi.org/10.13156/arac.2023.19.6.952>
- Logunov D.V. 2012. A synopsis of the genus *Zyuzicosa* Logunov, 2010 (Aranei: Lycosidae) // *Arthropoda Selecta*. Vol.21. No.4. P.349–362. <https://doi.org/10.15298/arthscl.21.4.05>
- Logunov D.V. 2023. Further notes on the fossorial wolf spiders of Middle Asia and the Near East (Aranei: Lycosidae) // *Arthropoda Selecta*. Vol.32. No.4. P.475–512. <https://doi.org/10.15298/arthscl.32.4.12>
- Logunov D.V. 2024. On two *Karakumosa* species (Aranei: Lycosidae), with new faunistic records for three fossorial wolf-spiders from Middle Asia and the Caucasus // *Arthropoda Selecta*. Vol.33. N.3. P.407–416. <https://doi.org/10.15298/arthscl.33.3.09>
- Logunov D.V., Fomichev A.A. 2021. A new species of *Karakumosa* Logunov & Ponomarev, 2020 (Araneae: Lycosidae: Lycosinae) from Tajikistan // *Arachnology*. Vol.18. Pt.7. P.677–680. <https://doi.org/10.13156/arac.2020.18.7.677>
- Logunov D.V., Ponomarev A.V. 2020. *Karakumosa* gen. nov., a new Central Asian genus of fossorial wolf spiders (Araneae: Lycosidae: Lycosinae) // *Revue suisse de Zoologie*. T.127. Fasc.2. P.275–313. <https://doi.org/10.35929/RSZ.0021>
- Shafaie S., Nadolny A.A., Mirshamsi O. 2022. A new species of *Lycosa* and three new species and a new record of *Karakumosa* from Iran (Araneae, Lycosidae) // *Zootaxa*. Vol.5120. No.4. P.501–522. <https://doi.org/10.11646/zootaxa.5120.4.3>
- Wang L.Y., Yang Y.S., Zhang Z.S. 2023. First record of the wolf spider genus *Karakumosa* from China, with description of a new species (Araneae: Lycosidae) // *Acta Arachnologica Sinica*. Vol.32. No.2. P.93–97. <https://doi.org/10.3969/j.issn.1005-9628.2023.02.005>
- WSC. 2025. World Spider Catalog. Version 25.5. Natural History Museum Bern, online at <http://wsc.nmbe.ch> (accessed on January 2025). <https://doi.org/10.24436/2>

Responsible editor D.V. Logunov